

HUMAN PAPILLOMAVIRUS IN ARGENTINA: AN IN-  
DEPTH STUDY OF THE CAUSE OF THE FREQUENCY OF  
HPV IN WOMEN IN BUENOS AIRES

TO ANALYZE THE REASONS WHY HPV IS SO  
PREVALENT IN WOMEN IN BUENOS AIRES AND TO  
DETERMINE WHY THE SPREAD OF HPV PERSISTS  
DESPITE MANY PREVENTION METHODS

by

FOLEY GALVIN

A THESIS

Presented to the Department of Biology  
and the Robert D. Clark Honors College  
in partial fulfillment of the requirements for the degree of  
Bachelor of Science

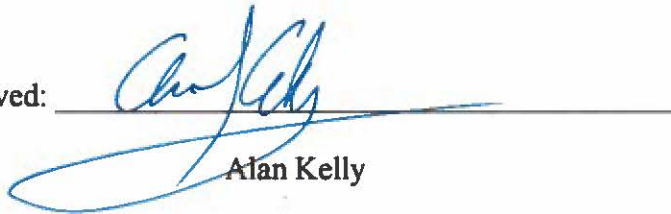
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## **An Abstract of the Thesis of**

Foley Galvin for the degree of Bachelor of Science  
in the Department of General Science to be taken June 2016

Title: Human Papillomavirus in Argentina: An In-Depth Study of the Cause of the  
Frequency of HPV in Women in Buenos Aires

Approved: \_\_\_\_\_



Alan Kelly

**Human Papillomavirus in Argentina:** An in-depth study of the cause of the widespread incidence of HPV among the women in Buenos Aires to determine why HPV is so prevalent in this population despite many available prevention methods.

### **Contextual Information:**

The Human Papillomavirus is the most common sexually transmitted infection (STI) in the world, and can lead to serious health problems such as cancer ("Human Papillomavirus"). However, it is also easily preventable. A series of vaccines as well as condoms can prevent the spread of this virus ("Human Papillomavirus"). Argentina's public health care system offers free vaccinations and contraceptives that can prevent HPV infection. Despite its preventability, HPV infection is still common. There are over 100 different forms of HPV (Ministerio de Salud), and almost every sexually active person will contract some form of HPV in his or her lifetime ("Human Papillomavirus"). Like other diseases, such as the common cold or flu, there is no treatment for HPV, but the body's immune system can fight off the virus. However, unlike the cold or flu, which last only a matter of days, HPV infection can last years, providing ample time for an infected person to pass the disease on to a sexual partner. In addition, the symptoms of HPV may not appear for months or years, so individuals may be unaware that they have HPV ("Virus del Papiloma

Human”). If a person’s immune system is weakened, the HPV can cause cells to become cancerous or lead to genital warts (“Virus del Papiloma Human”). A study conducted in Argentina found that 51.6% of women surveyed tested positive for HPV. Of that total, 7.3% tested positive for more than one form of HPV, and more than a quarter of them were found to have a form of HPV linked to cervical cancer (“HPV vaccine in Argentina”).

This investigation seeks to determine why HPV remains a problem in Buenos Aires despite its preventability.

### **Methodology:**

This study uses qualitative and quantitative information from primary and secondary sources. Secondary sources made up the majority of the quantitative information. The Ministry of Health of Buenos Aires and the Instituto Nacional del Cancer provided statistics on percentages of women with varying forms of HPV and cervical cancer. Qualitative information was obtained from interviews of medical professionals and parents with daughters. Both the qualitative and quantitative information was analyzed to identify reasons for the high rates of HPV in Buenos Aires.

### **Results:**

After conducting interviews with medical professionals and parents of girls of vaccination age, and analyzing statistics of HPV patients, I concluded that the prevalence of HPV in Argentina can be attributed primarily to the public’s lack of knowledge regarding HPV, and its vaccine. Misinformation and a general lack of knowledge have made some persons wary of the vaccine. Factors such as low income level, limited access to the public healthcare system, inconvenience, and parents’ personal bias against the vaccine seemed to play only small roles in deterring people from the vaccine and using other forms of prevention. Despite programs designed to educate people about HPV and to promote the HPV vaccine, many people still seem unaware of the severity of the infection and the availability and effectiveness of the vaccine.

## **Acknowledgements**

I would like to thank Professors Alan Kelly, Mayra Bottaro and Mark Carey for helping me to examine fully the impact of HPV in Argentina from both a scientific and cultural perspective. Their assistance has provided me with unique insight on a serious health issue that will require both a change in patient care and political action to be resolved. Alan Kelly has aided me greatly in the development of the scientific aspect of this project. Mayra Bottaro has been an excellent resource for ensuring that the culture of Argentina has been accurately portrayed and for helping me to edit my Spanish translations. Many thanks also to Mark Carey for assisting me in approaching and organizing the thesis process, as well as patiently answering my many questions.

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## **Introduction**

There are over 100 types of the Human Papillomavirus—some relatively harmless and some potentially deadly (“Virus del Papiloma Human”). These different forms of the virus can cause numerous problems, from genital warts to cervical cancer. Around 40 types of HPV can affect the genital area of both males and females (“Human Papillomavirus”). While the body’s immune system can generally eliminate the virus after a few years, symptoms may not be apparent for years or may never surface. Thus, people carrying the disease may be unaware that they are contagious. Infected people then unknowingly transmit the disease to their sexual partners, who may in turn display more severe symptoms.

HPV is very common. Almost every sexually active person will contract some form of HPV in his or her lifetime (“Human Papillomavirus”). Frequently, men will contract strains of HPV without presenting symptoms. They may then pass the disease on to a sexual partner. Women, in contrast, are more likely to present with symptoms and be affected by the disease. Both men and women are capable of naturally combating HPV; however, if their immune system has difficulties combating HPV, the virus can have more severe effects on the body.

HPV can cause genital warts or several types of cancer. However, the types of HPV that cause cervical cancer do not cause genital warts (“Human Papillomavirus”). In rare cases a mother with genital warts may transmit a respiratory illness during birth known as respiratory papillomatosis (RRP), in which the baby may develop warts in its throat and have trouble breathing (“Human Papillomavirus”). Patients with weaker immune systems may have HPV for

years. HPV can damage cells throughout the body that may become cancerous even after the HPV has been eradicated (“Virus del Papiloma Human”).

According to the National Cancer Institute:

Once HPV enters an epithelial cell, the virus begins to make the proteins it encodes. Two of the proteins made by high-risk HPVs (E6 and E7) interfere with cell functions that normally prevent excessive growth, helping the cell to grow in an uncontrolled manner and to avoid cell death. Many times these infected cells are recognized by the immune system and eliminated. Sometimes, however, these infected cells are not destroyed, and a persistent infection results. As the persistently infected cells continue to grow, they may develop mutations in cellular genes that promote even more abnormal cell growth, leading to the formation of an area of precancerous cells and, ultimately, a cancerous tumor.

(“HPV and Cancer”)

Cervical cancer is the second most common type of cancer among women in the world. In Argentina, cervical cancer ranks as the third most common type of cancer and the second most common for women. But, unlike other forms of cancer, most cervical cancer can be prevented with a vaccine. In 2013, 4,956 new cases of cervical cancer were diagnosed in Argentina. 99% of cervical cancer cases are caused by a form of HPV. Approximately 70% of cases are due to high-risk forms of HPV such as types HPV16 or HPV18 while 30% of cases are caused by lower risk forms (“Human Papillomavirus (HPV) Vaccines”). Lower-risk forms can still be cancer causing but cervical cancer is more likely to develop from the high-risk forms. While some HPV symptoms like genital warts generally dissipate over time, other forms of HPV can have other severe repercussions. Cancerous forms of HPV can affect can permanently affect cells even after the virus has cleared. Thus, while a person with HPV may eventually

fight off the disease, their damaged cells can become cancerous (“Human Papillomavirus”).

In a study conducted in Buenos Aires in 2007, tissue samples from 77 patients were assayed for HPV at the Stomatology Department of the Faculty of Dentistry at the University of Buenos Aires. Of these samples, 55.8% of the samples tested positive for a form of HPV. Among the 55.8%, 60% of the strains of HPV had the potential to be cancer causing. The most frequent types of HPV present were forms 6, 11 and 16. While strain 6 is relatively harmless, strain 16 has been identified as cancer causing (“HPV vaccine in Argentina”). On average 20.1% of women in Argentina have a form of HPV that could lead to cervical cancer (“Human Papillomavirus and Related Cancers”).

The HPV vaccine was first approved in Argentina in 2006. There are currently two different forms of the vaccine—Cervarix and Gardasil. While both are effective in preventing cancer, only Gardasil additionally prevents genital warts (“Human Papillomavirus”). According to the World Health Organization, in Argentina the HPV vaccine can first be administered to girls of age nine years and older. However, the vaccine is free for only girls who are 11-year-old girls (“HPV vaccine in Argentina”). The vaccine can cost around 400 pesos (around 40 US dollars) for children and young adults over twelve (Pianko, 2014). In 2008, a non-governmental organization started a campaign to promote the vaccine. However, due to poor program implementation and criticism about the promotion of the vaccine, the campaign left many Argentines with a bad image of the vaccine (Arrossi, 2012). At a press conference in 2011, the President of Argentina, Cristina Fernandez de Kirchner,



explained the importance of the HPV vaccine. She also spoke about Eva Peron, a beloved heroine in Argentine history who died from cervical cancer that was likely caused by HPV (Buenos Aires Herald). Through the President's efforts the Ministry of Health of Argentina added the HPV vaccine to the National Immunization Program in October 2011 meaning that the vaccine is now encouraged for girls ages 9-12 but is still not mandatory ("Human Papillomavirus and Related Cancers").

There are two tests that can detect HPV or cancerous lesions. One is called the HPV test. Women 30 and older can have this simple test done. However this test is available in only a few provinces in Argentina and is not yet available in Buenos Aires (Paolino, 2014). If the HPV test is unavailable, for women younger than 30 or if the results are positive for HPV, an additional test called a Papanicolaou test (also known as a Pap smear) can be performed. If woman's Pap smear is positive—indicating the presence of abnormal cells most likely resulting from HPV, the woman will repeat the test in a year wherein most cases this will have been ample time for the woman's body to rid the virus. While the results of a Pap smear cannot detect specifically for HPV, the presence of abnormal cells and the severity of the infection can be determined. The results of a Pap are categorized according to the Bethesda System that reports a woman's Pap on a scale depending on the severity of abnormality ranging from relatively harmless "atypical squamous cells of undetermined significance" to "adenocarcinoma" cancerous cells ("Pap and HPV Testing."). Pap smears are free to all women in Buenos Aires ("Las Dos Necesitan un PAP").

## **Methodology**

This thesis aims to explore the causes of the high prevalence of HPV in Argentina—specifically in the city of Buenos Aires. Argentina’s universal health care system provides free HPV vaccination to 11-year-old girls, as well as free HPV testing should aid in the prevention of HPV and cervical cancer. Therefore, I am going to investigate why HPV infection remains such a problem in Buenos Aires despite preventability.

There are several explanations for the high incidence of HPV. First, the cost of the HPV vaccines for persons over the age of 12 years could deter some from receiving them.

For the free vaccines, it may be difficult for a patient to schedule an appointment to receive them. The vaccines also require three separate doses several months apart. While the vaccines are not time sensitive, they are fully effective only if all three doses are administered (“Human Papillomavirus”). Therefore, it is crucial that the patient is able to receive all three vaccinations, which may be difficult given the crowded public clinics in Argentina. Interviews conducted with public health professionals can help to give a better understanding of if cost or scheduling issues are key factors preventing people from receiving the vaccine.

Additionally, a comparison of vaccination rates for HPV and other diseases between Argentina and other countries could shed light on whether or not Argentina’s vaccination rates are a general problem or are specific to HPV.

It is possible that many people are uneducated about the simplicity of preventing HPV infection through the vaccine or condom use. Also, people may be unaware of the

severity HPV. Unlike the some infections that lasts only a matter of days or weeks, HPV can last for years—giving the infected person ample time to infect other people with the virus. Determining the population’s level of understanding about HPV incidence and risks and the options available for preventing its spread may reveal whether a lack of HPV education is a leading cause in the spread of the infection. This information can be gathered through interviews, population-based surveys and previously conducted studies.

While perhaps not as pronounced as in the United States, anti-vaccination movements may play a part in the negative perception of the HPV vaccines. Anti-vaccination groups are motivated by various factors such as religion or false health risks associated with the vaccine. An in-depth look at the motivation behind these groups and at their impact on Argentine society could indicate whether anti-vaccination groups deter the public from receiving the HPV vaccine.

The recommended age for a person to become vaccinated against HPV is before he or she is sexually active (“HPV vaccine in Argentina”). Additionally, between 9 and 13 years of age, the body will produce the highest immune response making the age the optimal time for a person to be vaccinated (“HPV Vaccine Is Recommended for Boys”). But for many parents this is controversial. Often parents refuse to admit that their children may become sexually active at a young age and thus may not permit their children to become vaccinated in time. This can be detrimental to the children’s health if they contract HPV after becoming sexually active but before being vaccinated. Although the vaccine should be administered at a young age, it is recommended that any person age 26 or younger should consider getting the vaccine to

reduce their risk of HPV, genital warts and cancer ("HPV Vaccine Is Recommended for Boys"). Parental opinions gained from interviews and previous studies will aid the investigation because they can provide insight into whether parents' choices influence the high rates of HPV.

Dating and sexual customs, such as an increase in promiscuity, in Argentina may affect how quickly HPV spreads from one person to another. Sexual habits can greatly affect the transmission of a disease, and negative views of HPV prevention methods could lead to a faster spread of HPV. In addition, the age that people become sexually active can affect how quickly the disease spreads. The earlier a person becomes sexually active, the less likely they have been vaccinated for HPV or been exposed to sex education. Doctor's observations recorded via interviews of patterns of sexual relations among their patients will help to determine the cause behind the high rates of HPV. Additionally, studies regarding the sexual activity of adolescents in Argentina could provide insight into if teen promiscuity could be one reason the incidence of HPV is so high.

Both qualitative and quantitative information are important for this investigation. The statistics from secondary sources give factual support to the causes behind the prevalence of HPV. The Center for Disease Control of the United States, The Ministry of Health of Buenos Aires and of Argentina, The World Health Organization, The National Cancer Institute of Argentina and published studies conducted by the Argentine government provide data to support this investigation. Interviews with medical professionals provide a better understanding of the personal choices that affect susceptibility to HPV infection and add a deeper understanding of the perceptions

people have about HPV, the vaccine, and the resulting risks of cervical cancer. Doctors providing their perspective on their patients' views of HPV, how the public healthcare system works to prevent HPV and cervical cancer, and why they believe HPV remains such a large issue in Argentina.

## **Limitations**

Many limitations to this study were recognized during this investigation. The investigation started with the intention of asking women about their personal habits regarding HPV prevention. But, it became apparent that because HPV relates to a person's sexual health, interviewing women about their sexual history would be difficult. Therefore, all interviews conducted were with medical professionals and adults with daughters.

In addition, because HPV infection often does not present with any symptoms, the majority of people living with HPV are unaware they have it. This made it more difficult to find sufficient information on HPV-infected populations. This investigation had to be expanded to consider women who suffer from cervical cancer that most likely is caused by HPV, because these women are more closely studied.

## **Evidential Support**

### **Quantitative Analysis**

Because HPV often does not present with symptoms, the presence of cervical cancer in women is a better indicator of the prevalence of HPV as the majority of cervical cancer cases result from HPV infection ("Human Papillomavirus (HPV) Vaccines"). According to the World Health Organization, the cervical cancer mortality rate in Argentina is almost four times higher than that in the United States ("Worldwide Cancer mortality statistics"); in the province of Buenos Aires the mortality rate of cervical cancer is above the Argentine national average (Arrossi and Paolino, 2008)(Figure I).

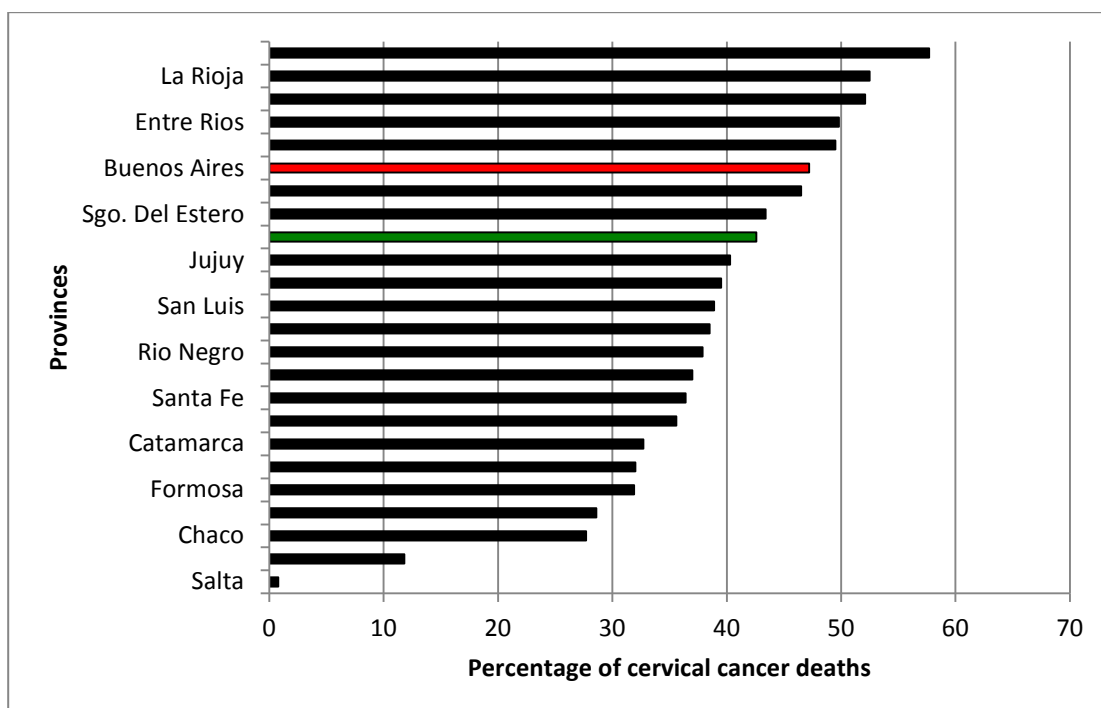


Figure I: Percentage of cervical cancer related deaths of total uterine cancer related deaths by jurisdiction (2003-2005)

Source: (Arrossi, 2008)

Since the introduction of the HPV vaccine in 2006 in both Argentina and the United States, Argentina still trails behind the US in its overall vaccination rate. In the US on average, 60% of girls have received all three doses although this number varies from state to state ("HPV Vaccine Coverage Maps"). Comparatively in Argentina, while the first dose is high at 87.9%, only 52.2% of girls have received all three doses (Patel et al, 2016).

Cervical cancer in general is equally prevalent in women regardless of income, personal beliefs or marital status. Table I shows various characteristics among women with cervical cancer. The table shows that the majority of women with cervical cancer live above the poverty line. Data collected from 2002-2004 found that 45% of women with cervical cancer live below the poverty. However in 2003, another study found that



51.7 of Argentinians were living below the poverty line ("The World Factbook: Argentina"). This indicates that poor socioeconomic status does not play a significant role in a women's likelihood to contract HPV. The data suggest that women living above the poverty level are just as likely to develop cervical cancer, implying that factors like the cost of the vaccine or healthcare access in public clinics may only be a small factor in high cervical cancer rates.

A study conducted in 2012 in Argentina (Arrossi et al., 2012) concluded that "no significant differences in socio-demographic characteristics were found among women who would or would not get vaccinated." Once informed of the vaccine and its benefits, the 226 women participating in the study were asked if they were in agreement with the vaccine. 75% of the women in the study answered "surely/probably yes". Additionally, the most frequent reason women cited for their lack of vaccination was that their doctor had not recommended it. Thus, doctor recommendations could increase the vaccination rate. The study also determined that the potential acceptability of the vaccine is high given that there is acceptance among the professional community and vaccine is affordable but somehow critical information about HPV and cervical cancer is not being relayed to patients (Arrossi et al., 2012).

<b>Socio-demographic characteristics</b>	<b>% (n=120)</b>
<b>Average age</b>	51
<b>Level of education</b>	

Never attended school	6.7
Attended primary school	69.2
Attended secondary and third level schooling	24.2
<b>Civil state</b>	
Married	54.2
Single	9.2
Divorced	36.7
<b>House size</b>	
1-2	28.3
3-5	52.5
6-12	19.2
<b>Poverty level</b>	
Above	55.0
Below	45.0
<b>Type of housing</b>	
Adequate	70.8
Inadequate	29.2
<b>Occupation</b>	
Employed without social protection	37.5
Unemployed	13.3

Inactive	49.2
<b>Health coverage (private or through employment)</b>	
No	75.8
Yes	24.2

Table I. Argentina. Socio-demographic characteristics of cervical cancer patients (2002-2004)

Source: (Arrossi, 2008)

In addition, the majority of women with cervical cancer are married women—suggesting that it is not only women with multiple sexual partners who are at high risk for contracting HPV, but monogamous women as well. This could also be attributed to the fact that HPV can lie dormant within the body even after a woman is married. Cervical cancer also can take year to develop causing a high number of cervical cancer cases in older women. Additionally, this table shows that a high incidence rate from cervical cancer correlates with a lack of education: 69.2% of women with cervical cancer have completed only a primary level of education (Arrossi and Paolino, 2008) while 90.6% of the general female population in Argentina has completed a primary level or higher ("Estadísticas", 2015). For many years in Argentina cervical cancer has been thought of as a disease that affects only the poor. In one analysis of cervical cancer in Argentina, Doctor Silvina Arrossi argues that is not only poor women who are affected by cervical cancer, Additionally, many women wait until it is too late for treatment before their cancer is diagnosed. She states the cervical cancer generates poverty and creates social vulnerability for these women—especially women who are

working informally and therefore do not have social protections like health care (Arrossi and Paolino, 2008)

Since the HPV vaccine was first introduced in 2006, cervical cancer rates have remained rather steady (Zamberlin, 2011) (See Figure II). In theory, the introduction of the HPV vaccine should have led to a decline in cervical cancer over time, yet cervical cancer rates remain greatly unchanged. However, it is likely that the effect of girls who were vaccinated for HPV will not be seen as a decrease in cervical cancer for many years as the average age of cervical cancer diagnosis is much later in life.

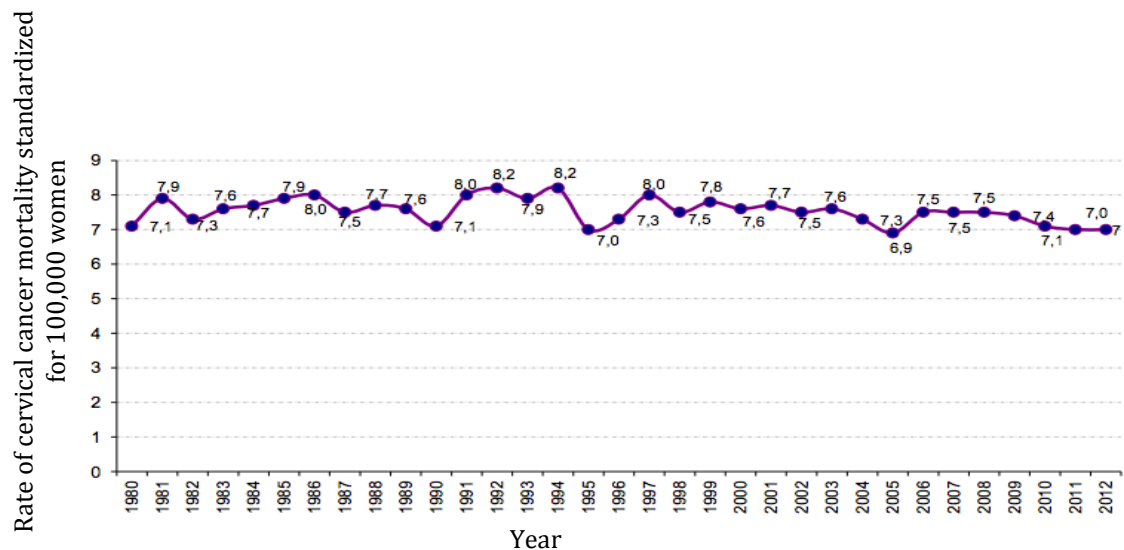


Figure II: Rate of cervical cancer mortality by year standardized for 100,000 women

Source: (Arrossi, 2008)

Vaccination efforts in Argentina in general appear successful. Vaccination coverage for other diseases ranges from 91 to 100 percent (“Immunization, Measles”). Argentina vaccinated around 95% of children against the measles virus in 2011, while the U.S. vaccination rate for measles has actually decreased slightly from 92% to 91%

in recent years (“Immunization, Measles”). While these values may not be statistically significant, it appears that the low rate of HPV vaccination in Argentina is an exception to the otherwise overall high vaccination rate in this country.

While not as forceful as in the United States, anti-vaccination movements, such as the “Libre Vacunacion” movement, contribute to vaccination non-compliance in populations. These organizations have as their mission granting parents the freedom to choose whether or not they want to have their children vaccinated, as many vaccinations are mandatory in Argentina. Libre Vacunacion, which translates to Free Vaccination, cites the many states in the U.S. in which parents have the right to choose to vaccinate their children, and the group requests the same freedom in Argentina. They have started a petition to abolish the mandatory vaccination laws. They also warn that 40% of doctors do not inform their patients of potential risks associated with vaccines (“Libre Vacunacion”). While this statistic may be true, many of the associated risks are negligible, or the benefits of that vaccine far outweigh potential side effects. An article published in La Nacion, one of Argentina’s leading newspapers, explains that despite some risks, vaccinations, along with clean drinking water, has decreased the mortality rate the most worldwide (Dema, 2014). La Nacion also details how some people in Argentina are misinformed about the physiology of immunity. Some individuals believe that diseases like HPV can be beneficial by ridding the body of other diseases, but this is medically inaccurate (Dema, 2014).

An article published in 2014, entitled “The Risk of Misinforming when Talking about Vaccination” also shed light on the circulation of misinformation regarding vaccination in Argentina (Paradigma, 2014). Some anti-vaccine movements have spread

rumors that mandatory vaccinations are a collaboration between pharmaceutical companies and the government, and that vaccines can cause serious health risks, such as autism. A paper published in 1998 showing a link between vaccines and autism (Rao, 2011) was retracted in 2010 because information in the study had been falsified. According to an article entitled “Doctors in Argentina Sound the Alert on Vaccine Skeptics” by Marcela Valente, the retraction of the article did not stop public uncertainty surrounding the safety of vaccination (Valente, 2013).

In response to an flawed article entitled “Vaccines: yes or no?” (Etchebarne, 2014) the Argentine Scientific Journalism Network (“Vacunas: Una Desinformación Peligrosa”) issued a press release warning people about serious misinformation in important health matters like vaccines. The release also countered the notion believed by many people that some diseases have been eradicated, and the corresponding vaccines are thus no longer necessary. The release points out that in countries in which vaccination is not mandatory, preventable diseases like measles and whooping cough are on the rise (“Vacunas: Una Desinformación Peligrosa”).

Another article published in La Nacion, “Who Are the Parents Who Don’t Vaccinate Their Children and What are They Thinking?” (Dema, 2014) describes how parents believe vaccines are filled with harmful chemicals and vaccines can prevent children from contracting conditions that are actually good for their health. The official response to this article from the Ministry of Health of Argentina was a reminder that, according to law 22909, all mandatory vaccines are free and are not only beneficial to the individual being vaccinated, but to society as a whole. Having the general public vaccinated protects those who cannot be vaccinated, such as pregnant women or the

elderly. Despite these anti-vaccination movements, the secretary of the Argentine Pediatric Society's Committee on Infectious Diseases, Carlotta Russ, commented on these movements stating that, "Fortunately, in Argentina, the anti-vaccine movement is not strong" (Valenta, 2013). While there is some backlash against the HPV vaccination, these movements do not seem to play a significant role in low vaccination rates and the high incidence of HPV and cervical cancer (Doctors in Argentina).

A journal article published in 2016 (Patel et al, 2016) sought to measure the success of the implementation of the HPV vaccine. The study concluded that overall implementation of the vaccine was successful, citing nearly 100% coverage rates for the first dose of the vaccine for girls born in 2000 or 2001 in some areas. However, this number varied greatly around the country and drastically dropped for each subsequent dose. Because the vaccine is effective only if an individual receives all three doses, the third dose is the most important and the best indicator of vaccination coverage. The article concluded "the Argentinian government has been able to achieve high average rates of coverage by the HPV vaccine since including the vaccine in its national immunization schedule. However, further program effort is needed to reduce the variance in HPV coverage rates across provinces and improve HPV coverage rates across all three vaccination doses" (Patel et al, 2016).

In 2012, an extensive survey (Chaparro et al, 2016) was conducted to determine the acceptance rate of the HPV vaccine of parents of girls eligible to be vaccinated, their knowledge of HPV, and how religion may affect their willingness to vaccinate their daughters. The study found that the overall acceptance rate (those who supported HPV vaccination) of parents to vaccinate their daughters was low at only 46.6%. 85.5% said

that they had heard of HPV but only 52.7% knew there was a vaccine that could prevent infection of harmful strains. Religion was practiced by 86.8% of the parents surveyed. The study concluded that despite a large percentage of parents who practice religion, the parents did not cite religion or their socioeconomic status and the cost of the vaccine as the cause of the low rate of acceptance. The majority of parents seemed to be in opposition to the vaccine for unknown reasons. This study provides data that suggests religion is not a primary factor in a parent's choice to vaccinate their daughter (Chaparro et al, 2016).

A comparison of the United States and Argentina reveals that sexual activity of teenagers in the two countries is comparable. A survey conducted in 2012 by Dr. Jonatan Konfino (Konfino, 2012) interviewed 13-15 year old students at several schools in Argentina. The survey showed that 36.9% of the students interviewed had sexual intercourse (Konfino, 2012)(Table II). This number varied between genders—among boys surveyed 43.5% had had sexual intercourse while only 30.7% of girls had (Konfino, 2012). In the United States, it was found that 46.8% of high school students had sexual intercourse. This number is slightly lower for 15 years olds at 41.4% (Konfino, 2012)(Table III.). This indicates that because the number of teenagers in the United States is comparable to the number of teenagers in Argentina that the high rates of HPV in Argentina is most likely not caused by promiscuity of teenagers who have not yet received the vaccine.



<b>Sexual Behaviors</b>			
	<b>Average</b>	<b>Boys</b>	<b>Girls</b>
Percentage of students who ever had sexual intercourse	36.9 (34.0-39.8)	43.5 (40.1-47.0)	30.7 (27.7-33.9)
Among students who ever had sexual intercourse, the percentage who had sexual intercourse for the first time before age 14 years	58.8 (55.5-62.0)	66.5 (62.8-70.0)	49.2 (44.9-53.6)

Table II. Argentina. 2012 Fact Sheet. Results for students aged 13-15 years

Source: ((Konfino, 2012)

Category	Ever had sexual intercourse						Had first sexual intercourse before age 13 years					
	Female		Male		Total		Female		Male		Total	
	%	CI*	%	CI	%	CI	%	CI	%	CI	%	CI
<b>Race/Ethnicity</b>												
White†	45.3	(41.2-49.4)	42.2	(38.5-46.1)	43.7	(40.2-47.4)	2.1	(1.4-3.1)	4.4	(3.7-5.4)	3.3	(2.6-4.0)
Black†	53.4	(48.0-58.7)	68.4	(63.4-73.0)	60.6	(56.2-64.8)	4.9	(3.6-6.6)	24.0	(19.9-28.6)	14.0	(11.7-16.7)
Hispanic	46.9	(40.8-53.1)	51.7	(46.3-57.0)	49.2	(43.9-54.5)	3.8	(2.9-5.1)	9.2	(7.0-12.0)	6.4	(5.3-7.8)
<b>Grade</b>												
9	28.1	(24.5-31.8)	32.0	(28.3-36.0)	30.0	(27.3-32.9)	2.9	(2.3-3.5)	8.7	(6.8-11.2)	5.8	(4.7-7.0)
10	41.7	(36.7-46.9)	41.1	(35.8-46.7)	41.4	(36.9-46.1)	3.2	(2.1-4.8)	8.7	(6.8-11.2)	6.0	(4.8-7.4)
11	53.9	(48.7-59.0)	54.3	(49.6-59.0)	54.1	(50.1-58.1)	3.3	(2.2-4.9)	8.0	(6.2-10.3)	5.6	(4.4-7.1)
12	62.8	(58.0-67.4)	65.4	(60.5-70.0)	64.1	(59.7-68.3)	2.5	(1.6-4.0)	7.4	(5.7-9.7)	4.9	(4.0-6.0)
<b>Total</b>	<b>46.0</b>	<b>(42.5-49.6)</b>	<b>47.5</b>	<b>(44.3-50.7)</b>	<b>46.8</b>	<b>(43.7-49.8)</b>	<b>3.1</b>	<b>(2.6-3.7)</b>	<b>8.3</b>	<b>(6.9-9.9)</b>	<b>5.6</b>	<b>(4.9-6.5)</b>

\* 95% confidence interval.

† Non-Hispanic.

Table III. United States. Percentage of high school students who ever had sexual intercourse and who had sexual intercourse for the first time before age 13 years, by sex, race/ethnicity, and grade — United States, Youth Risk Behavior Survey, 2013

Source: (Frieden, 2013)

## **Qualitative Analysis**

Two gynecologists, Mónica Pianko and Moira Perkins, were interviewed at the Centro de Salud Y Acción Comunitaria 34 (CeSAC 34) in Buenos Aires. Doctors were asked if they felt that patients had adequate access for appointments to receive the vaccine, and if the CeSACs are adequately supplied with the vaccine and with other methods of prevention, such as condoms. Both doctors agreed that appointments are readily available for girls to be vaccinated and that clinics are well supplied with the HPV vaccines and condoms.

The two gynecologists were questioned about what they believed to be the biggest factor in the prevalence of HPV. They both agreed that misinformation and a lack of education contributed to the high rates of HPV and cervical cancer. There are only two programs currently in place to promote awareness about HPV and cervical cancer. One program is the National Vaccination Program (Paolino, Melisa interview). The other is the National Program for the Prevention of Cervical Cancer (Paolino, 2014). This program aims to 1) treat and study women with cervical cancer, 2) educate the community, 3) supervise how information is given to the public, and 4) monitor the directors in charge of cancer prevention to attempt to help the program run smoothly (Paolino, 2014). Despite these guidelines put forth by the program, information about HPV and cervical cancer is not reaching all in the target audience.

Melisa Paolino, who works at the National Cancer Institute of Argentina conducting research on cervical cancer, expressed concern about the level of women's knowledge of HPV and its links to cervical cancer. In her opinion, most women were familiar with Pap smears, the test designed to detect abnormal cervical cells. When they

were questioned about cervical cancer, however, fewer women were familiar with this disease. Fewer still were aware of HPV and the vaccine, and the relationship between HPV and cervical cancer (Paolino, 2014).

In the three interviews conducted with people in various healthcare fields, all agreed they saw few economic or social factors that affected a woman's likeliness to contract HPV. The gynecologists saw no relationship between social-economic level and an increased risk of HPV (Pianko, Monica). The only social factor observed that could increase a woman's likelihood to contract HPV was whether she chose to have unprotected sex with multiple partners (Perkins, 2014).

I conducted an informal survey with parents whose daughters had the potential to be vaccinated. This revealed that most were familiar with HPV, but fewer were familiar with the vaccine. Of the parents who were familiar with HPV, all of them agreed that they wanted their daughters to be vaccinated and had no ethical concerns about the vaccine. Despite the fact that HPV vaccination is now part of the national vaccination campaign, many parents are still unfamiliar with HPV-related diseases. Compounding the problem is the fact that the vaccine is free for only eleven-year-old girls. This is a relatively small window of time considering that the girls must receive all three doses in this time frame for full immunity.

A study conducted by the Ministry of Health of Argentina created 14 focus groups composed of 79 women between the ages of 25 and 64 and surveyed them about their perceptions of cervical cancer and Pap smears (Zamberlin, 2011). Some women described how they go to the doctor only if she feels sick. They did not see the point in going to the doctor if nothing appeared to be wrong (Zamberlin, 2011). Other women

believed that if one was married, or had only one sexual partner, a Pap smear was no longer necessary (Zamberlin, 2011). Other women believed that Pap smears were shameful and could be very painful (Zamberlin, 2011). This misinformation further inhibits women from protecting themselves and others against the spread of HPV. The study concluded that the general knowledge of women about the causes of cervical cancer was “vague and confused” and the majority of the women surveyed were unaware of the role of HPV in the prevalence of cervical cancer (Zamberlin, 2011).

## **Conclusion**

What proved to be the biggest obstacle for Argentine females getting vaccinated was the lack of education about HPV among women and parents of vaccine-eligible daughters. As shown in Table II, a lack of education corresponds with a woman's likelihood of developing cervical cancer, which was most likely a result of the woman having HPV. As stated in the interviews with gynecologists, the government of Argentina adequately supplies the public clinics with condoms and vaccines that can prevent the transmission of HPV. Therefore, it is not the public health system of Argentina that is responsible for the rapid transmission of this disease. The medical professionals also agreed that there were no obvious economic patterns that would explain higher HPV rates in Argentina compared to those of the United States.

When parents were asked if they were in agreement with the vaccine, those who were familiar with the vaccine unanimously said that they favored vaccination. Parents' personal bias is not a large factor in the high prevalence of HPV, as all seemed willing to vaccinate their daughters. However, a concerning number of parents interviewed had not heard of the vaccine. Many people in Buenos Aires remain uneducated about HPV, which supports the notion that this lack of information could be the biggest contributing factor to high rates of HPV and cervical cancer.

In conclusion, it was the opinion of all medical professionals interviewed supported by population surveys that misinformation and a lack of understanding of HPV accounted for the prevalence of HPV in Buenos Aires. This conclusion is supported by interviews conducted with parents of vaccine-eligible girls. Previous studies suggest that religion, socioeconomic status, and anti-vaccination movements do not likely hinder vaccination efforts.

## **Future Direction**

One important step that can be taken towards HPV prevention is to introduce the HPV test to other provinces. Considering that the majority of the population of Argentina resides in the city of Buenos Aires, the HPV test could be a very useful tool to prevent the spread of HPV in this large metropolitan area. If women in Buenos Aires were able to receive this test would and learn that they had contracted the virus, they could take precautions to ensure they do not infect others.

In 2006 the HPV vaccine was approved by the Food and Drug Administration of the United States (Zamberlin, 2011). The US is taking steps to vaccinate as many people as possible, including boys. Since males are often asymptomatic for HPV infection, this preventative step will help reduce the number of cervical cancer cases in women. In addition, the vaccine is mandatory in 21 states in order to attend public school (Zamberlin, 2011). In the future, the government of Argentina could work to promote the vaccine for males as well as make the vaccine mandatory for school-age children throughout the provinces.

## Appendix:

### Informed Consent

Mi nombre es Foley Galvin y soy estudiante de biología en la Universidad de Oregon en los Estados Unidos. En 2014, la entrevisté mientras estaba haciendo un intercambio en Buenos Aires en donde le pregunté sobre su experiencia en relación con la prevención de la propagación del VPH. Actualmente continúo desarrollando mi investigación sobre este tema, y me preguntaba si sería posible retomar la línea de nuestra entrevista y expandir mis preguntas sobre el VPH y sus métodos de prevención. Estaría extremadamente agradecida por su ayuda y colaboración, con miras a expandir y solidificar mi proyecto. En tanto profesional de la salud, su opinión ofrece una perspectiva invaluable para mi trabajo y esta entrevista no conllevará ningún riesgo para usted. El propósito de solicitarle una nueva entrevista obedece a la necesidad de entender más cabalmente las razones por las cuales el VPH parece ser un problema prevalente en la población de Buenos Aires, aun a pesar de la variedad en los métodos de prevención. Entenderé si usted no se sintiera cómodo/a respondiendo a alguna o a todas las preguntas del cuestionario, o si hubiera decidido no permitirme usar la información que he obtenido durante nuestra entrevista del 2014. De más está decir, que puedo omitir cualquier información que usted no desee que forme parte de mi estudio, incluido su nombre si prefiere resguardar su identidad como confidencial. En cualquier caso, por favor, no dude en hacérmelo saber por vía de correo electrónico, especialmente si usted no deseara participar de esta nueva entrevista. Si acepta participar, por favor, complete con respuestas breves las preguntas que se encuentran a continuación de este documento. Sus respuestas serán transmitidas por vía de correo electrónico y serán archivadas en una carpeta protegida con contraseña especial. Como parte del proceso de transparencia de la Universidad, debo informarle oficialmente que en la mayoría de las investigaciones, existe un pequeño riesgo de que su información llegue a manos de quien no debería acceder a ella. Adicionalmente, debo informarle que el correo electrónico no es considerado el medio más seguro de comunicación. Finalmente, agradecería si usted pudiera darme permiso para utilizar en mi estudio la información que ha compartido conmigo en ocasión de nuestra entrevista del 2014. Desde ya, estoy muy agradecida por su disponibilidad para hablar conmigo y por compartir su experiencia sobre este tema. Todas nuestras interacciones serán archivadas en una computadora bajo contraseña cifrada. Cuando concluya mi estudio, podré compartir mis resultados con usted, si así lo desea, pero no percibirá beneficios adicionales. Por favor, guarde una copia de su consentimiento para su archivo personal. Si completa y devuelve las respuestas a las preguntas que se hallan a continuación, usted estará dando su consentimiento para participar en esta investigación. . Si tiene alguna pregunta sobre sus derechos como sujeto de investigación, puede comunicarse con: Research Compliance Services, Universidad de Oregon al (541) 346-2510 o [ResearchCompliance@uoregon.edu](mailto:ResearchCompliance@uoregon.edu).



Le reitero mi profundo agradecimiento por su ayuda para completar mi investigación.

Muy cordialmente,

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Preguntas:

1. ¿Cuáles son los métodos más prevalentes de prevención en la zona donde usted trabaja?
2. ¿Cuál considera que es la población más afectada por el VPH en esta zona? ¿Quiénes la conforman (por ejemplo, mujeres, edad, con hijos, solteras, en pareja, con otros problemas de salud, etc.)?
3. En su trabajo, ¿ha observado algún factor específico (como hábitos sexuales, etc.) que contribuyan a la contracción de VPH?
4. ¿Qué tipo de personal médico trata más frecuentemente con personas que hayan contraído el VPH?
5. En su opinión, ¿la gente de la zona donde trabaja tiene acceso a información sobre el VPH?
6. ¿Dónde obtienen esa información?
7. En su opinión, ¿la gente de la zona donde trabaja conoce métodos de prevención de VPH?
8. ¿Cuál es el método de prevención más utilizado de VPH en esta zona? ¿Por qué?
9. En su opinión, ¿cuáles son las barreras en el acceso a los métodos de prevención?

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